# SNS COLLEGE OF TECHNOLOGY

*(An Autonomous Institution)*

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**COIMBATORE-641 035, TAMIL NADU**

## DEPARTMENT OF COMPUTER APPLICATIONS

### 23CAT601 - DATA COMMUNICATION AND NETWORK

### CLASS : I YEAR / I SEMESTER

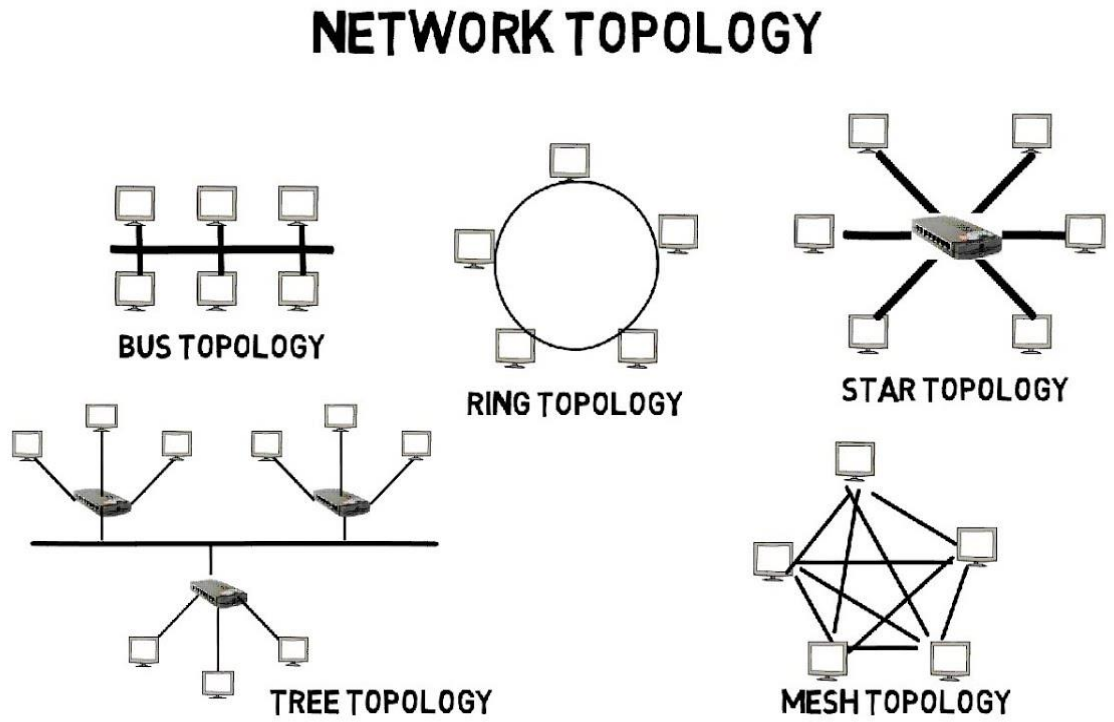
### UNIT I – DATA COMMUNICATION

### TOPIC – NETWORK TOPOLOGY

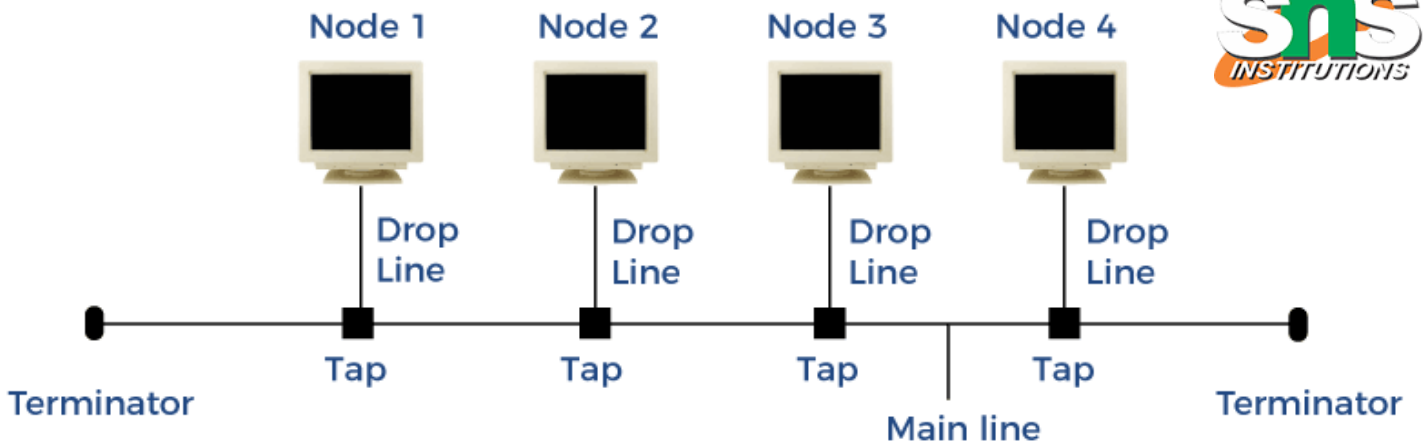
# Network Topology

The arrangement of a network that comprises nodes and connecting lines via sender and receiver is referred to as **Network Topology**. The various network topologies are:

- Point to Point Topology
- Mesh Topology
- Star Topology
- Bus Topology
- Ring Topology
- Tree Topology
- Hybrid Topology



# Bus Topology




Bus Topology

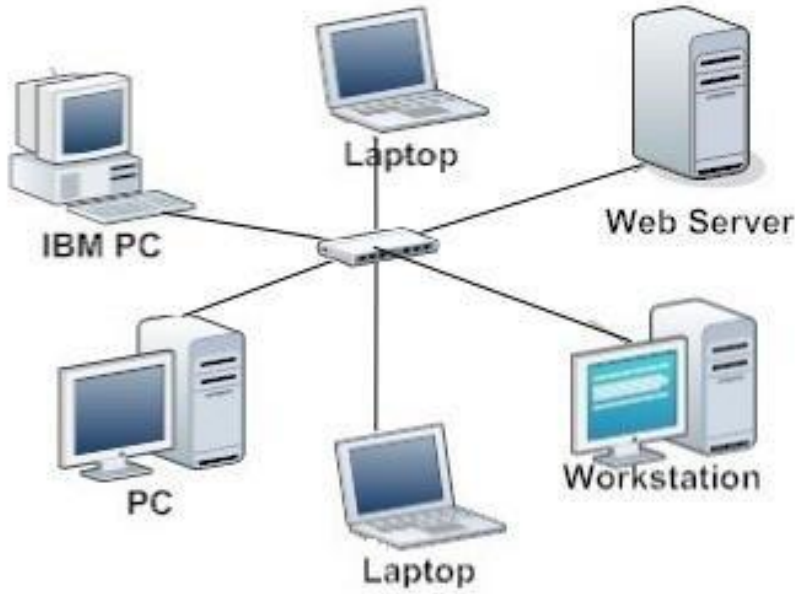
- ✓ The bus topology is designed in such a way that all the stations are connected through a single cable known as a backbone cable.
- ✓ Each node is either connected to the backbone cable by drop cable or directly connected to the backbone cable.
- ✓ When a node wants to send a message over the network, it puts a message over the network. All the stations available in the network will receive the message whether it has been addressed or not.

# Ring Topology


- ✓ Ring topology is like a bus topology, but with connected ends.
- ✓ The node that receives the message from the previous computer will retransmit to the next node.
- ✓ The data flows in one direction, i.e., it is unidirectional.
- ✓ The data flows in a single loop continuously known as an endless loop.
- ✓ It has no terminated ends, i.e., each node is connected to other node and having no termination point.
- ✓ The data in a ring topology flow in a clockwise direction.
- ✓ The most common access method of the ring topology is token passing.

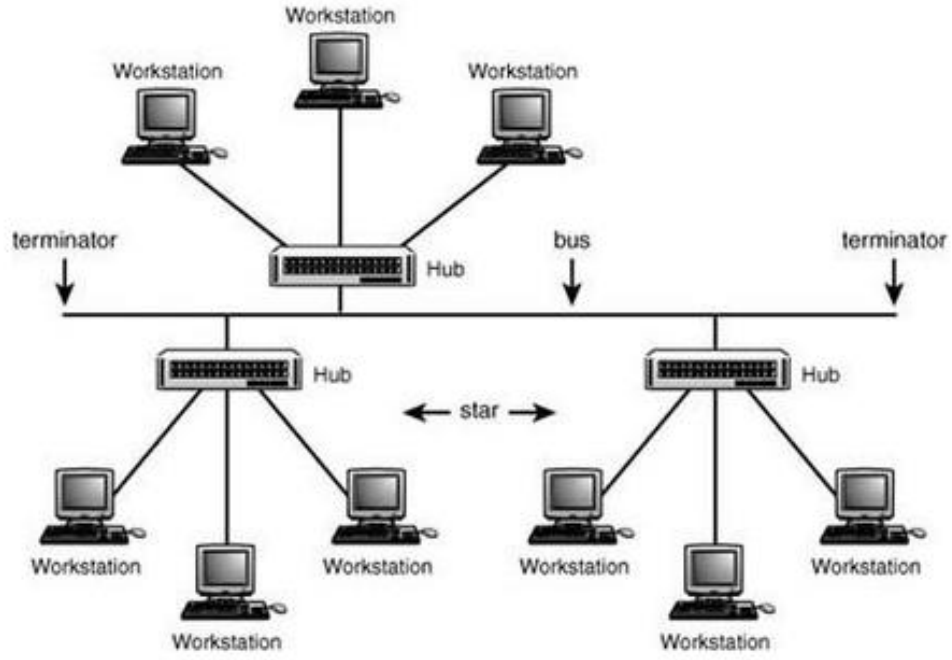
# Star Topology

- ✓ Star topology is an arrangement of the network in which every node is connected to the central hub, switch or a central computer.
- ✓ The central computer is known as a server and the peripheral devices attached to the server are known as clients.
- ✓ Coaxial cable or RJ-45 cables are used to connect the computers.
- ✓ Hubs or Switches are mainly used as
- ✓ connection devices in a physical star topology.
- ✓ Star topology is the most popular topology in network implementation.



# Tree Topology

- ✓ Tree topology combines the characteristics of bus topology and star topology.
- ✓ A tree topology is a type of structure in which all the computers are connected with each other in hierarchical fashion.
- ✓ The top-most node in tree topology is known as a root node, and all other nodes are the descendants of the root node.
- ✓ There is only one path exists between two nodes for the data transmission. Thus, it forms a parent-child hierarchy.

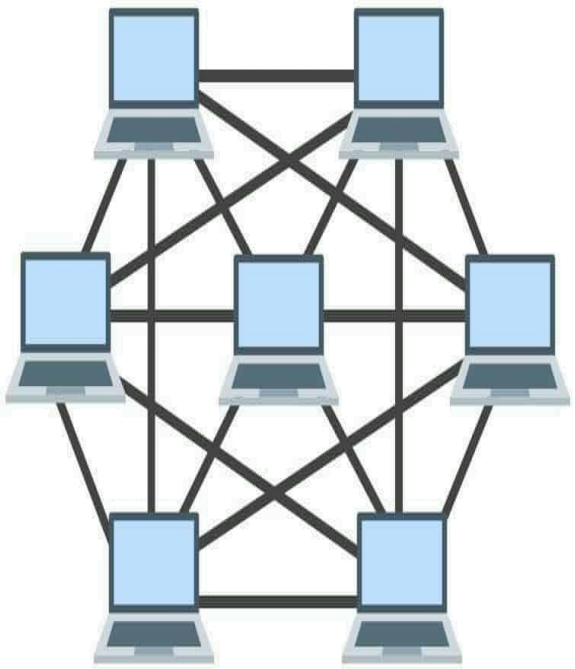


# Mesh Topology

- ✓ Mesh technology is an arrangement of the network in which computers are interconnected with each other through various redundant connections.
- ✓ There are multiple paths from one computer to another computer.
- ✓ It does not contain the switch, hub or any central computer which acts as a central point of communication.
- ✓ The Internet is an example of the mesh topology. Mesh topology is mainly used for WAN implementations where communication failures are a critical concern.
- ✓ Mesh topology is mainly used for wireless networks.
- ✓ Mesh topology can be formed by using the formula:

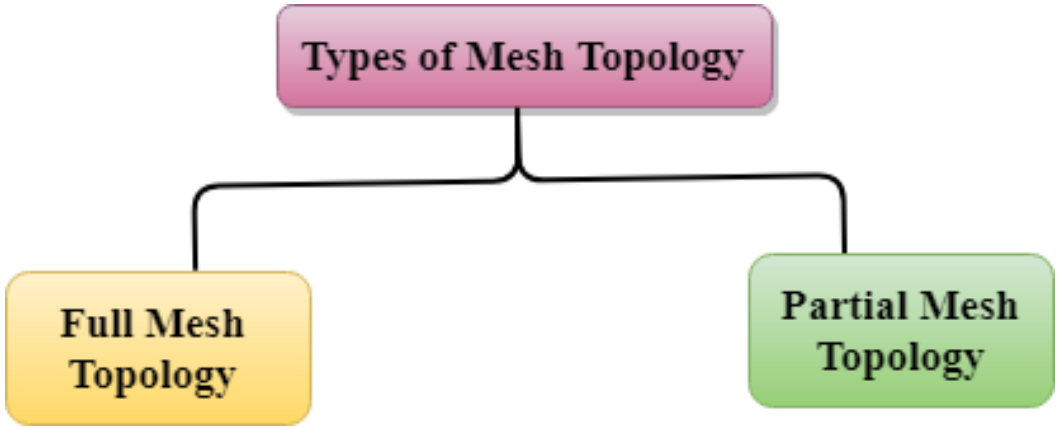
**Number of cables = (n*(n-1))/2;**

(Where n is the number of nodes that represents the network.)



**Mesh topology is divided into two categories:**

- Fully connected mesh topology
- Partially connected mesh topology




- **Full Mesh Topology:** In a full mesh topology, each computer is connected to all the computers available in the network.
- **Partial Mesh Topology:** In a partial mesh not all but certain computers are connected to those computers with which they communicate frequently.

# Hybrid

- ✓ The combination of various different topologies is known as **Hybrid topology**.
- ✓ A Hybrid topology is a connection between different links and nodes to transfer the data.
- ✓ When two or more different topologies are combined together is termed as Hybrid topology and if similar topologies are connected with each other will not result in Hybrid topology.
- ✓ For example, if there exist a ring topology in one branch of ICICI bank and bus topology in another branch of ICICI bank, connecting these two topologies will result in Hybrid topology.